

Bellwork: 5/22/13

Solve each equation:

1) $\log_2(2x+16) = 3$

$$2^3 = 2x + 16$$

$$8 = 2x + 16$$

$$-8 = 2x$$

$$\boxed{-4 = x}$$

2) $\log_5(x^2 - 7x) = \log_5 30$

$$x^2 - 7x = 30$$

$$x^2 - 7x - 30 = 0$$

$$(x - 10)(x + 3)$$

$$\boxed{x = 10, -3}$$

Type 3: $\text{LOG} + \text{LOG} = \#$ - condense to one log, swirl and solve.

10) $\log_3 8 + \log_3 6x = 5$

$$\log_3 48x = 5$$

$$3^5 = 48x$$

$$243 = 48x$$

Try these:

13) $\log x + \log 5 = 2$

$$\log_{10} 5x = 2$$

$$10^2 = 5x$$

$$100 = 5x$$

$$\boxed{20 = x}$$

11) $\log_2(2x) = \log_2 5 + 3$

$$x^2 + 21x - 100 = 0$$

$$(x + 25)(x - 4) = 0$$

$$x = -25, 4$$

$$\boxed{x = 4}$$

12) $\log x + \log(x + 21) = 2$

$$\log_{10} x(x + 21) = 2$$

$$\log_{10} x^2 + 21x = 2$$

$$10^2 = x^2 + 21x$$

$$100 = x^2 + 21x$$

14) $\log_4 25 + \log_4 x^2 = 1$

$$\log_4 \frac{25}{x^2} = 1$$

$$4x^2 - 25 = 0$$

$$4x^2 = \frac{25}{x^2} \cdot x^2 (2x + 5)(2x - 5)$$

$$4x^2 = 25$$

$$\boxed{x = -\frac{5}{2}, \frac{5}{2}}$$

Type 4: $\text{LOG} + \text{LOG} = \text{LOG}$ - condense two logs to one, then cancel and solve.

15) $\log_5 x \cdot \log_5 6 = \log_5 16$

$$\log_5 \frac{x}{6} = \log_5 16$$

$$\frac{x}{6} = 16$$

$$\boxed{x = 96}$$

Try these:

17) $\log_4 x - \log_4 3 = \log_4 24$

16) $\log(x+1) + \log x = \log 12$

$$\log (x+1)x = \log 12$$

$$\log x^2 + 1x = \log 12$$

$$x^2 + 1x = 12$$

$$x^2 + x - 12 = 0$$

$$(x+4)(x-3) \quad x = -4, 3$$

18) $\log(x-3) + \log x = \log 4$

$$\boxed{x = 3}$$

log(-4) doesn't work

Homework: pg 32 #11-20

